Transplanting Ornamental Trees and Shrubs

UNITED STATES DEPARTMENT OF AGRICULTURE

HOME AND GARDEN BULLETIN NUMBER 192

PREPARED BY AGRICULTURAL RESEARCH SERVICE

TRANSPLANTING ORNAMENTAL TREES AND SHRUBS

You might need to move a plant because it is too crowded, because it gets too much or too little shade, or simply because it may be more appealing or useful in another place. Whatever the reason, you begin to dig up that tree or shrub you want to move.

If, at this point, you tell yourself that transplanting is nothing more than digging up and planting again, you may be disappointed when your newly transplanted tree or shrub doesn't grow well or when it dies during the first year. There are, however, many things you can do to help insure successful transplanting.

WHAT TO TRANSPLANT

Successful transplanting can depend entirely on the individual plant you select to move. The kind of tree or shrub, however, isn't always as important as its age, size, and condition. For instance, young plants and small plants can be transplanted with less risk than older or larger ones. Healthy plants are more likely to survive the shock of transplanting than unhealthy ones.

Sometimes you might want to move an unhealthy plant to a more suitable location. Transplanting for this reason may be especially helpful for plants that manage to survive in their present environment but lack vigor. A change of environment more suited to the needs of the plant often can restore its vitality.

Healthy Plants

Good indicators of a plant's health and vigor are the length of annual twig growth, the condition of buds and flowers, the number of dead branches, and the size and color of the leaves. Wilting, stunted growth, malformation, and disease spots are signs of poor health.

Hardy Plants

Plants are considered hardy when they can withstand various extremes of environmental conditions, such as very low winter temperatures and extreme summer heat and drought.

Moving a plant from one part of your property to another should not affect its hardiness unless there are extreme changes in wind and sun exposure.

If you wish to move a plant from one part of the country to another, make sure that the plant will be hardy in its new location. If temperature differences are too extreme at the new location, the plant will not survive.

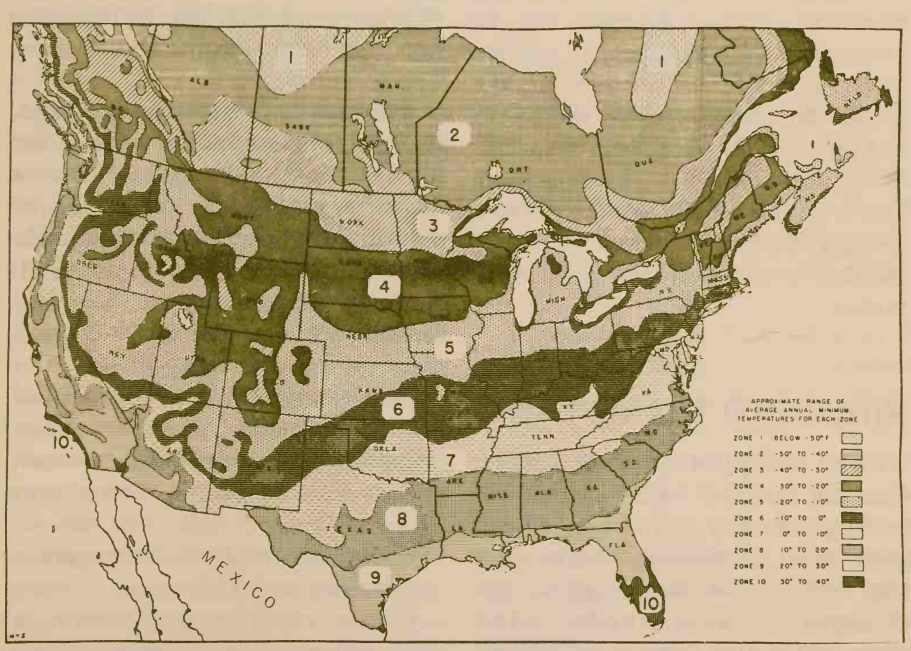
Temperature zones affecting plant hardiness are indicated on the plant hardiness map (below). Perhaps the best way to tell whether your plant will survive in a certain area of the country is to consult the nurseries in that area. The trees and shrubs nurserymen raise and sell should be hardy for their areas.

Before moving any plant into another State, check State plant quarantine regulations.

WHEN TO TRANSPLANT

The best time for transplanting deciduous trees and shrubs is when they are still dormant in early spring or after they have become dormant in the fall. How long they are dormant depends upon the climate as well as the kind of plant.

In the spring, deciduous trees and shrubs should be moved before the buds start to grow. In the fall, they should be moved only after their leaves turn color and drop off. Transplant only when the ground is not frozen and is workable.



Plant Hardiness Map

Spring planting is advisable in areas that have severe winters. Transplant evergreen and deciduous trees and shrubs in the spring if you live in an area with strong, drying winter winds; deficient soil moisture; or deeply frozen ground during the winter months. Trees and shrubs should be watered well before transplanting if the soil is very dry.

Evergreens can be transplanted earlier in the fall and later in the spring than deciduous plants. They may be moved from early September to June if the weather is not too severe.

If you transplant in the summer, make sure that the root ball is kept moist while it is out of the ground. Because of high temperatures in summer, plants have a greater tendency to lose too much moisture through evaporation.

You can cut down this water loss by using a transpiration-inhibiting chemical. Antitranspirants can be purchased at nurseries or garden supply stores. When sprayed onto the plant, the chemical coats the leaves and reduces moisture loss.

Another method of reducing water loss is to shade the plant for the first few days after replanting. One way of shading is to cover the plant with burlap.

WHERE TO TRANSPLANT

Select the planting site carefully. Consider not only where a plant will look good, but also where it will grow most successfully. Make sure that your plant can adapt to any changes in sun, shade, wind exposure, and soil moisture. In addition, avoid such common mistakes as placing plants too close together to get quick screening effects, setting young trees under windows, and crowding the walls of buildings.

At the new site, provide enough space above and below the ground to allow for future spreading and growth of the top and roots of the plant. Later crowding may deform it, stunt its growth, or eventually kill it.

HOW TO TRANSPLANT

Digging

When digging up a deciduous tree or shrub, avoid injuring as many roots as possible. Start digging from the outer edge of the crown, and carefully remove the soil while working toward the trunk until the main roots are found. Dig the soil from around the roots—without completely baring them—with a minimum of bruising and cutting. Any extra soil will help to retain the fine "hair" roots, which absorb moisture from the soil.

Evergreens, on the other hand, must have a lot of soil around the roots. For this reason, they must be dug with a root ball. The size of the root ball will vary with the size of the plant and the type of soil around it. Normally, however, a root ball of 1 foot in radius to each inch of trunk diameter is recommended.

Evergreens require a root ball and deciduous plants normally do not. There are some exceptions, however, for deciduous plants. Deciduous plants need a root ball when they—

- Have a trunk diameter greater than 3 inches.
- Are considered difficult to transplant, such as dogwoods and magnolias.

- Are transplanted in the summer or when they are in full leaf.

Whether your plant requires a root ball or whether you can move it bare rooted, always keep the roots moist. If they dry out while the plant is out of the ground, the plant is likely to die.

Branches of trees and shrubs may be held together with rope, twine, or a piece of burlap to avoid breakage and to hold them in a compact position when digging.

TRANSPLANTING FROM THE WILD

With amateur handling, such plants as dogwoods, oaks, and maples often will die when moved from the woods. The key to successfully moving wild trees and shrubs is root pruning.

The process of root pruning and transplanting larger plants from the wild should be done over a period of a year.

In root pruning, a trench is dug at the same distance from the trunk as when digging a root ball. Go out from the trunk 1 foot for each inch diameter of the trunk before cutting the existing roots. Refill the trench with topsoil into which the plant will form a dense mass of new fibrous roots. When the tree or shrub is transplanted the following year, these roots will help hold the root ball together and will provide a sufficient root system for the plant in its new location.

Though most plants can be transplanted successfully this way, plants that have very dominant top roots, such as hickory and sassafras, may not survive.

When root pruning smaller plants, a trench is unnecessary. A sharp spade may be used to cut the roots to the depth of the spade, while leaving the plant in place. Transplanting should then be done during the spring or fall.

Rare or protected species should not be removed unless they are endangered by encroaching construction or would otherwise be lost.

Remember also that when you move a plant from a wild to a cultivated environment, you may be changing its habitat to such an extent that the plant may be unable to adapt and will die. For example, if you move a wild tree that is adapted to a lot of shade and shelter in the woods to an open, sunlit spot, it may die through overexposure. If the tree must be moved to a more exposed place, protect its trunk by wrapping it with a strip of burlap.

Storing

If replanting is delayed for a few days, keep the roots and top moist by putting the plant in a protected place, sheltered from exposure to sun and wind. Cover the roots with moist peat, burlap, wet leaves, or waterproof plastic sheets.

If replanting is delayed 2 or 3 weeks, heel in the plant. First, choose a shady area away from drying winds. Then, dig a trench to accommodate the roots and slope one side 45 degrees or lower. Place the roots in the trench and rest the trunk or stem against the sloping side. Cover the roots with loose soil and keep them moist. Evergreens should be heeled in upright and placed close together if there are more than one.

digging up

1 Before you start to dig, go out 1 foot for each inch of trunk diameter.

2 Dig with the back of the spade toward the plant to avoid prying up uncut roots. After the rootball is cut, trim and shape the ball, and undercut the roots.

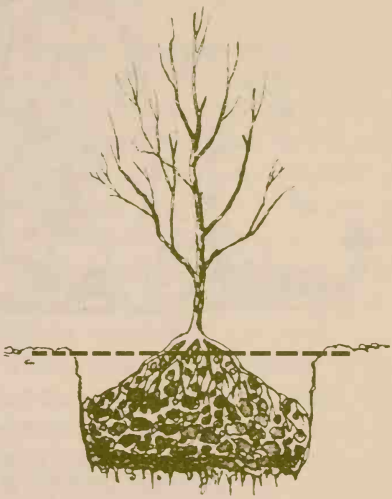
3 Tip the ball and tuck a roll of burlap under it. Tip the ball in the opposite direction; unroll and pull the burlap under the ball.

4 Pin the burlap together with nails. If the soil is especially dry and crumbling, further secure the burlap with a nylon cord or small rope. Do not lift the plant by its trunk or branches. Lift small plants by the rootball and larger ones by prying up with 2 spades.

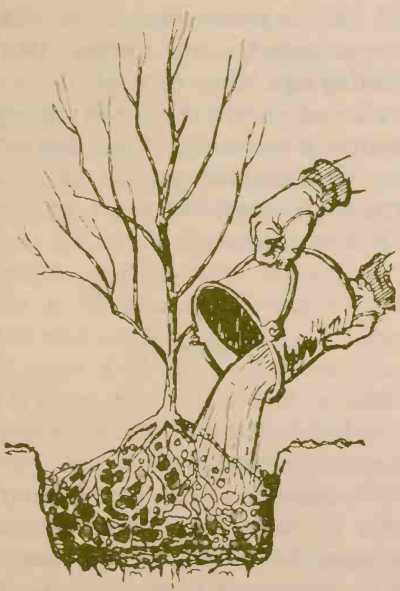
planting

1 Dig the hole a foot deeper than the height of the roots, and twice as wide as the root span, or the rootball. Loosen several inches of soil at the bottom of the hole to facilitate drainage.

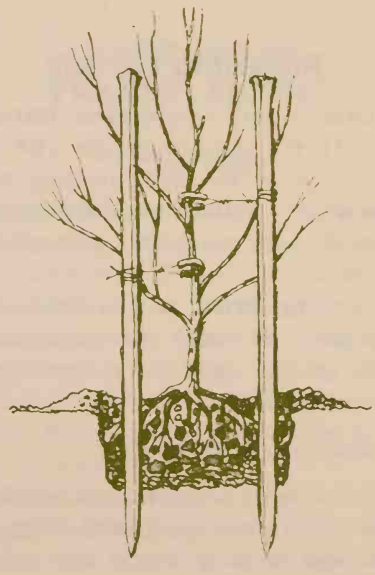
2 Add soil to the hole and build it up in a mound beneath the plant, so that the plant sits at a slightly higher level than before it was moved.



3 Fill three-fourths of the hole with soil, then water.



4 Fill the remaining part of the hole with soil, then for small plants drive in stakes to secure them. For securing large plants, use guy wires.



"Heel in" your tree or shrub if replanting is delayed.

After heeling in your plant, you may cover the roots with burlap to reduce evaporation of water from the roots.

Preparing the Soil

Usually soil composition, texture, aeration, and drainage can be improved at the new planting site. Good soil preparation promotes root growth of the newly transplanted tree or shrub.

Well-prepared soil will provide adequate drainage, moisture retention, aeration, and the proper degree of soil acidity.

Drainage and aeration

The texture and composition of the soil affect drainage and aeration. If drainage is poor, water will collect around the roots and cause them to rot. If aeration is poor, oxygen cannot reach the roots through the soil and the plant will suffocate. This is particularly true when transplanting into heavy clay soil.

If soil is not heavy or dense enough, it will not hold soil nutrients and an adequate amount of water around the roots. This is a problem with very sandy soils.

To test for drainage, dig a hole a foot or more deep and fill it with water. The next day, fill the hole with water again and see how long the water remains. If the water is absorbed in 12 hours, soil drainage is adequate for planting.

If water remains in the hole more than 12 hours, you can improve drainage by altering the consistency and composition of the soil. To do

this, mix the clay soil with sand or organic matter. Drainage can be further improved by digging the planting hole a foot deeper than required and filling in this extra space with stones, crushed rock, or gravel.

If the drainage test shows that your soil drains too rapidly, you can improve it by adding loam, clay, or organic material.

Soil acidity

Most of the woody ornamentals used in home planting are adapted to ordinary garden soils, but a few need a special type.

Rhododendrons, azaleas, mountain-laurel, and their relatives constitute a class of plants that will not thrive in ordinary sweet soil. These require an acid soil well supplied with organic matter.

You can increase the acidity of your soil by adding commercial fertilizers specifically prepared for acid-loving plants or by adding large amounts of peat moss or leaf mold from decayed oak leaves.

To find out if you have acid soil, consult your county agricultural agent or your local nurseryman about soil testing. If necessary, get directions for changing the acidity of your soil. Be sure to tell the person testing your soil which trees or shrubs you want to grow.

Planting

Before planting the tree or shrub, make sure that the planting hole is wide and deep enough. For bare-rooted plants, allow sufficient room to accommodate the roots in their natural position. For balled plants, dig the hole twice the width of the root ball. The plant should be set slightly higher than its original level.

After placing a bare-rooted plant into the hole, press the soil firmly around the base of the roots. Work the soil under the trunk or center of the plant to support it. This also keeps the plant from settling too much.

Set a balled plant in the hole, cut the twine from the stem or trunk, and draw the covering back from the root ball. Without damaging the exposed soil ball, carefully cut away the exposed burlap before replacing the soil in the hole. If the soil is loose, the burlap should remain intact. If the root ball is covered with plastic, it must be removed or cut away.

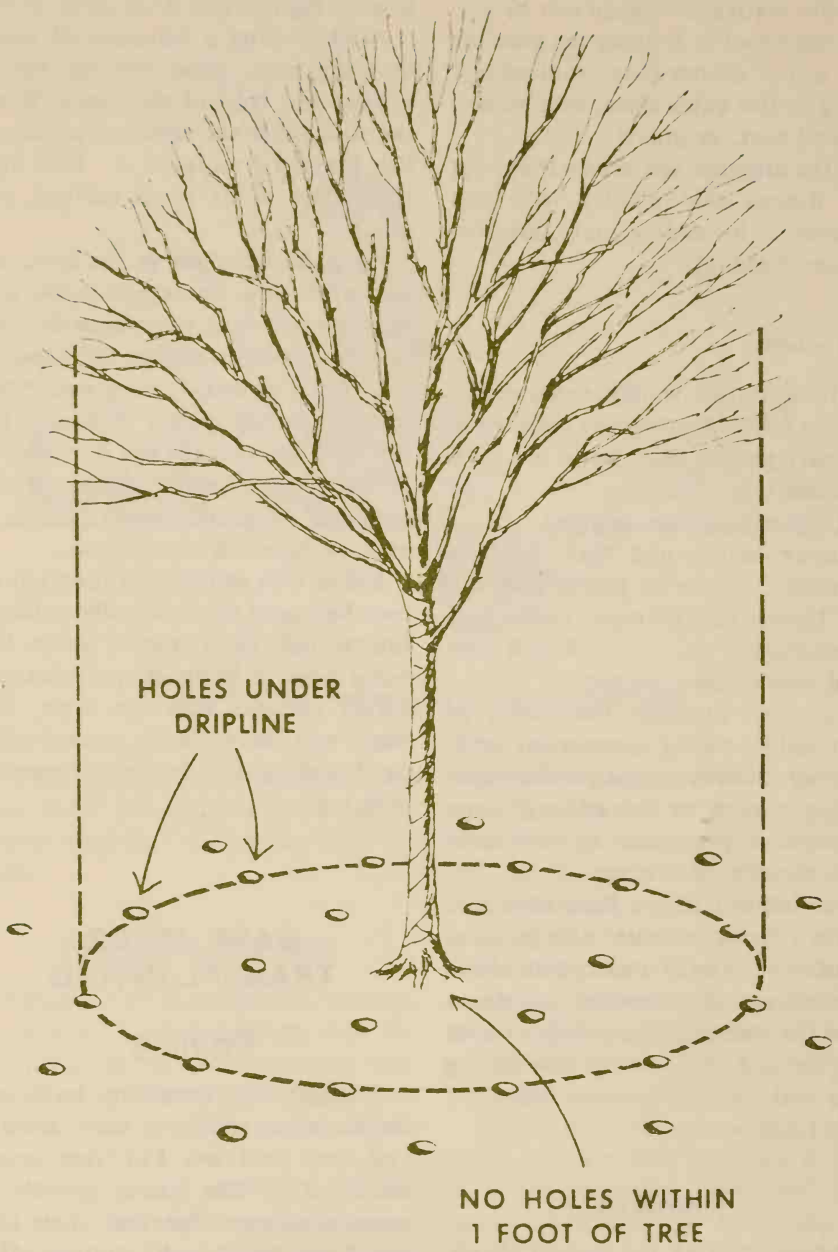
Fill in with soil around the roots or root ball until the hole is about three-fourths full. Then pour in water. The water helps to bring soil particles into direct contact with the roots. The water will also settle the surface soil 1 or 2 inches. Fill in this depression with soil.

CARE AFTER TRANSPLANTING

Pruning

Transplanting deciduous trees and shrubs often results in root damage and some root loss. For trees, prune one-third of the lateral growth to counterbalance this loss. You also can "top" the tree by cutting off a small portion of the top of the main stem. For shrubs, cut back one-third of the branches.

When replanting, you should prune diseased branches crossing branches that rub, and any branches that



To fertilize, make holes under the dripline first. Use these as a guide for digging evenly spaced holes to a foot from the trunk. Then, dig holes a few feet beyond the dripline so that new root growth will be fertilized.

detract from the shape and appearance of the plant.

Not all trees and shrubs must be pruned after transplanting. Evergreens, for example, may not need it because the root ball normally protects the roots from injury. Deciduous plants may not need pruning if they are planted in humid areas of the country. Where it is humid, new roots usually will be formed within a few weeks and will restore adequate water absorption from the soil.

Watering

Be careful to avoid extremes in watering. Too little water will cause the roots to dry up and die, and too much water may rot them away.

Newly transplanted trees and shrubs need regular watering during the spring, summer, and fall of the first year unless you plant in an area where rainfall is abundant.

In winter, evergreens retain their leaves and continue to lose water through them. For this reason, evergreens should be watered during dry winter periods when the soil is not frozen. Deciduous plants do not need watering in the winter since they are dormant and will not lose any moisture.

Do not water plants every day. Allow the soil to dry at the surface before you water again. Test the soil for dryness by crumbling it through your fingers. The amount of water needed is the amount that the soil can absorb. Stop watering when water no longer seeps rapidly into the soil.

Mulching

After planting, mulch the soil beneath the branches with a 3-inch layer of semidecayed wood chips, pine bark, well-settled manure, peat moss, leaf mold, or frost litter. Use only well-decayed material because the decomposition of such material as fresh manure, green plants, or fresh grass clippings releases byproducts that can be harmful to the roots.

To reduce damage by mice and decay, keep the mulch about a foot away from the trunk or stem of larger plants. Make sure that the mulch covers the area occupied by the roots. For small or young trees, reduce the depth of the mulch near the trunk or stem.

Fertilizing

If you use plenty of rich soil for backfilling, newly transplanted trees and shrubs are not likely to need fertilizer for the first year. However, if immediate growth seems stunted or leaves are paled, fertilizing is advisable.

Apply fertilizer in fall and early spring in the following way:

For trees.—Measure the diameter of the trunk 3 feet above the ground; use 2 pounds of 5-10-5 fertilizer for each inch of diameter. For trunks with a diameter of less than 3 inches, use 1/2 pound for each inch.

Using a soil auger, crowbar, or posthold digger, make holes 15 to 24 inches deep and 18 to 24 inches apart around the drip line of the tree (the area beneath the ends of the longest branches). Fertilize a few feet beyond the drip line especially for young trees.

Distribute the fertilizer equally among the holes, using 1/4 cup per hole. Then fill the holes with soil. A mixture of equal parts of

topsoil, sand, and peat moss is a good filling.

For shrubs.—Scatter 2 to 3 pounds of 5-10-5, 10-10-10, or a similar formula of water-soluble fertilizer per 100 square feet of area under shrubs. The fertilizer should be scratched into the soil lightly and then watered. Fertilize each year in the spring.

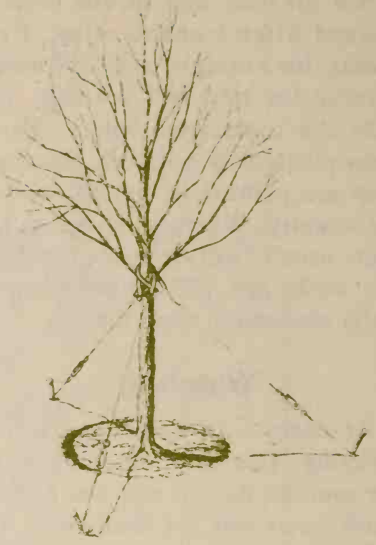
Protecting From Sun and Wind Damage

Young trees or those dug from shady areas easily may be damaged by sudden exposure to the sun. If you replant trees in an open area, protect them by wrapping the trunks with strips of burlap or durable paper.

To protect trees and shrubs from wind damage, install guy wires to hold them in place until the root system regenerates.

The number of guy wires needed depends on the size of the plant. You may wish to use wires with a turnbuckle so you can adjust the pull of the wires and can tighten them when they become loose.

Guy wires should be placed high enough so that leverage of the top does not loosen them. A crotch is a good place to anchor the wires.



Attaching a turnbuckle to each guy wire will enable you to tighten the wires when they loosen.

Use a short length of rubber hose around each wire to protect the bark from injury. Do not wrap the loop so tightly that the growth of the bark is restricted.

Fasten the wires securely to sturdy stakes or other solid anchors. If you use three guy wires, space anchors evenly. Place one anchor against the prevailing winds.

Reviewed by
Erik A. Neumann, ARS Curator of Education,
U.S. National Arboretum, Washington, D.C. 20002

Washington, D.C. Revised June 1977

☆ U.S. GOVERNMENT PRINTING OFFICE : 1977 O—238-748

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Stock No. 001-000-03706-4